

Remarks

Claims 1 to 25 are pending in the application. Claim 14 is amended.

§ 102 Rejections

Claims 1-2, 14, 15, 17-18 and 20 stand rejected under 35 USC § 102(b) as being anticipated by Knudson. In paragraph 3 of the Office Action, the Examiner states that Knudson, in Figures 1-6, discloses a body 26 made of polymeric material having an input end with a plurality of input openings in a first ordered arrangement, an output end with a plurality of openings in a second ordered arrangement different than the first ordered arrangement, and a plurality of isolated non-linear passageways (tubes) between the input and output openings for receiving a plurality of optical fibers 42. The Examiner further states that the body 26 can be made of unitary construction as shown in Figure 6 or by stacking a plurality of plates with grooves as shown in Figures 2-4. Knudson is further said to disclose alignment means 66, 68, as well as the use of injection molding to form the body. Applicants respectfully traverse the rejection for the following reasons.

Independent claim 1 describes an optical manifold comprising a unitary body having an input end and an output end. The input end has a plurality of input openings in a first ordered arrangement. The output end has a plurality of output openings in a second ordered arrangement which differs from the first ordered arrangement. The unitary body further comprising a plurality of integrally formed passageways, wherein each of said passageways connects a single input opening with a single output opening.

Independent claim 14 has been amended and now describes an optical manifold comprising a body having plurality of plates, each of said plates having an input end and an output end. Each plate is formed with a plurality of channels spanning the entire length of each plate from the input end to the output end. The body is constructed by arranging the plurality of plates in a stacked configuration to provide a plurality of input openings at the input end and a plurality of output openings at the output end. Each of the channels forms a passageway connecting a single input opening with a single output opening. The plurality of input openings are in a first ordered arrangement and the plurality of output openings are in a second ordered arrangement that differs from the first ordered arrangement.

With respect to independent claims 1 and 14, **Knudson does not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement**, as described in the present application. As set forth in the application at page 8, line 17 through page 9, line 2, the term “ordered arrangement” refers not to the actual spatial relationship or location of one opening relative to another, but rather to the relationship of an input opening to an output opening. Thus, even though the holes at both ends of the manifold may be disposed in an array, the ordered relationship of one hole to another at the input may be quite different from the ordered relationship at the output. In other words, by merely shifting the positions, relative to each other, of at least two fibers passing through an optical manifold, the ordered relationship of holes at the input end and output end of the manifold must be different.

In Knudson, it can be clearly seen that the input openings and output openings have the same ordered arrangement. In the image transfer device of Knudson, each transfer element of the conducts an elemental portion of an image between a first surface and a second surface. As explicitly stated in Knudson, “Such devices produce a magnification or reduction of the applied image.” (Column 6, lines 56-57). Knudson is specifically intended to “produce a high resolution image on the output end of the device.” (Column 2, lines 31-32). Knudson would not (and does not) position input and output openings in different ordered arrangements, because to do so would introduce distortions or other errors into the image on the output end of the device. That is, placing the input and output openings in different ordered arrangements would create the very distortion Knudson is seeking to avoid. The size and lateral spacing of the input and output openings in Knudson may differ (to provide image magnification or reduction), but the **order** of the openings does not differ. Accordingly, Knudson does not disclose input openings in a first ordered arrangement, and output openings in a second ordered arrangement which differs from that of the first ordered arrangement, as claimed in the present application.

For anticipation under 35 U.S.C. 102, the Knudson reference must teach every aspect of the claimed invention, either explicitly or implicitly. As set forth above, Knudson fails to meet this test. The rejection of independent claims 1 and 14 under 35 USC § 102(b) as being anticipated by Knudson has thus been overcome and should be withdrawn.

Claim 2 depends from independent claim 1, and claims 15, 17-18 and 20 depend from independent claim 14. As set forth above, independent claims 1 and 14 are not anticipated by Knudson. Therefore, dependent claims 2, 15, 17-18 and 20 are also not anticipated by Knudson, and the rejection of those claims under 35 USC § 102(b) as being anticipated by Knudson has also been overcome and should be withdrawn.

In summary, the rejection of claims 1-2,14,15,17-18, and 20 under 35 USC § 102(b) as being anticipated by Knudson has been overcome and should be withdrawn.

§ 103 Rejections

Claim 3, which depends from claim 1, stands rejected under 35 USC § 103(a) as being unpatentable over Knudson. Knudson is said to show all the features of the claim, except voids in the body to save material. The Examiner finds such a feature to be common knowledge, and states it would have been obvious to one of ordinary skill in the art to make the body of Knudson with voids because this would provide a means to save material, as is common knowledge.

Applicants have distinguished their invention, as embodied in independent claim 1, over Knudson because among other reasons, Knudson does not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement. Applicants' claim 3 recites that the unitary body contains voids to reduce the amount of polymeric material required. Even if it is common knowledge to provide voids in a body to save material, such knowledge in combination with Knudson does not overcome the deficiencies of Knudson. Specifically, the combination will not lead one skilled in the art to Applicants' invention in which input openings are in a first ordered arrangement and output openings are in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement.

For at least this reason, the rejection of claim 3 under 35 USC § 103(a) as being unpatentable over Knudson has been overcome and should be withdrawn.

Claims 4-5, which depend from claim 1, stand rejected under 35 USC § 103(a) as being unpatentable over Knudson in view of what the Examiner has termed "Applicants' admitted prior art" (AAPA), referring to page 9, lines 13-16 and page 10, lines 3-29 of Applicants' specification. The Examiner states that Knudson shows all the features of claims 4 and 5, except the material of

the unitary body being a metal, and the use of an additive manufacturing process. The AAPA at page 9, lines 13-16 is said to show that the use of polymers or metals for unitary bodies (housings) for optical fiber components is well known. The Examiner states it would have been obvious to one of ordinary skill in the art to make the Knudson unitary body of metal as shown by AAPA, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as matter of obvious design choice. The AAPA at page 10, lines 3-29 is said to show the use of additive manufacture processes are well known. The Examiner states it would have been obvious to one of ordinary skill in the art to make the Knudson unitary body by an additive manufacturing process because this provides a well-known process to make a three-dimensional unitary body.

Applicants have distinguished their invention, as embodied in independent claim 1, over Knudson because among other reasons, Knudson does not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement. Applicants' claim 4 recites that the unitary body is formed of a metal, and claim 5 recites that the unitary body is formed by an additive manufacturing process. Even if AAPA shows the use of metal unitary bodies, or the use of an additive manufacturing process, such teachings in combination with Knudson do not overcome the deficiencies of Knudson. Specifically, the combination will not lead one skilled in the art to Applicants' invention in which input openings are in a first ordered arrangement and output openings are in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement.

For at least this reason, the rejection of claims 4-5 under 35 USC § 103(a) as being unpatentable over Knudson in view of Applicant's admitted prior art (AAPA) has been overcome and should be withdrawn.

Claim 6, which depends from claim 1, stands rejected under 35 USC § 103(a) as being unpatentable over Knudson in view of Chen et al. The Examiner states that Knudson shows all the features of claim 6, except the use of abrasive laden slurry polishing. Chen is said to disclose the use of abrasive laden slurry for polishing optical waveguides (col. 2, lines 32-39). The Examiner states it would have been obvious to one of ordinary skill in the art to use abrasive laden slurry for

polishing Knudson's passageways because this would provide a much smoother surface as taught by Chen.

Applicants have distinguished their invention, as embodied in independent claim 1, over Knudson because among other reasons, Knudson does not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement. Applicants' claim 6 recites that the passageways have been smoothed by abrasive laden slurry polishing. Chen deals with planar optical waveguides. Even if Chen discloses polishing a waveguide using abrasive laden slurry, it does not overcome the deficiencies of Knudson because the combination of these two references will not lead one skilled in the art to Applicants' invention in which input openings are in a first ordered arrangement and output openings are in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement.

For at least this reason, the rejection of claim 6 under 35 USC § 103(a) as being unpatentable over Knudson has been overcome and should be withdrawn.

Claims 7-13, which depend either directly or indirectly from claim 1, stand rejected under 35 USC § 103(a) as being unpatentable over Knudson in view of Shahid. The Examiner states that Knudson shows all the features of claims 7-13, except a cable with strain relief, a connector at the input or output, a housing to enclose the body, and a plug-in card to make a shuffle mounted in a rack. The Examiner gives official notice that these features are well known in the art of optical fiber connectors. The Examiner further states it would have been obvious to one of ordinary skill in the art to provide these features to the Knudson body, because the features would provide means to connect the body to a plurality of other devices, strain relief, and protection from the outside environment. The Examiner does not provide specific reference to features of Shahid relative to the elements of claims 7-13.

Applicants have distinguished their invention, as embodied in independent claim 1, over Knudson because among other reasons, Knudson does not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement. Even if Shahid's optical harness is used with Knudson's image transfer device, this combination does not arrive at Applicants' claimed invention, because the resulting combination does not have input openings in a first

ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement.

For at least this reason, the rejection of claims 7-13 under 35 USC § 103(a) as being unpatentable over Knudson in view of Shahid has been overcome and should be withdrawn.

Claim 16, which depends from claim 14, stands rejected under 35 USC § 103(a) as being unpatentable over Knudson in view of Engstrand et al. The Examiner states that Knudson shows all the features of claim 16, except two channels intersecting on at least one plate. The Examiner cites Engstrand et al. as showing such an arrangement of channels on a plate in Figures 1-3. The Examiner further states it would have been obvious to one of ordinary skill in the art to arrange the channels of Knudson in a configuration as shown by Engstrand, because this would provide a further shuffling of the passageways if so desired.

Applicants have distinguished their invention, as embodied in amended independent claim 14, over Knudson because among other reasons, Knudson does not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement. Engstrand et al. '269 states that the cross-connected optical fibers 2 reside inside a MT-connector (col. 1, line 65 through col. 2, line 1). Contrary to the Examiner's characterization of the reference, **Engstrand et al. shows that the actual optical fibers cross, and does not show individual plates having channels where at least two of the channels intersect.** Therefore, the combination of Knudson and Engstrand et al. does not arrive at Applicants invention as presented in claim 16.

For at least this reason, the rejection of claim 16 under 35 USC § 103(a) as being unpatentable over Knudson in view of Engstrand et al has been overcome and should be withdrawn.

Claim 19, which depends from claim 14, stands rejected under 35 USC § 103(a) as being unpatentable over Knudson in view of Tanguay, Jr. et al. The Examiner states that Knudson shows all the features of claim 19, except the use of milling for making channels. Tanguay is said to disclose the use of milling for making channels 12 in a substrate 14. The Examiner further states it would have been obvious to one of ordinary skill in the art to use milling for forming channels in Knudson's plates, because this is a well known process for forming grooves, recesses, channels, etc.

Applicants have distinguished their invention, as embodied in amended independent claim 14, over Knudson because among other reasons, Knudson does not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement. Even if Tanguay discloses milling processes, the combination of cited references does not arrive at the invention of claim 19, because neither of the references disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement.

For at least this reason, the rejection of claim 19 under 35 USC § 103(a) as being unpatentable over Knudson in view of Tanguay, Jr. et al has been overcome and should be withdrawn.

Claims 21, 23 and 24 stand rejected under 35 USC § 103(a) as being unpatentable over Knudson in view of Bylander et al. The Examiner states that Knudson shows all the features of these claims, except the end plates with the plurality of openings. Bylander et al. (Figure 2) is said to show end plates 36 on two sides of a body in the center. The Examiner states it would have been obvious to one of ordinary skill in the art to provide such a feature to Knudson's body, because this would provide a means to support and provide strain relief to the optical fibers as shown by Bylander.

Independent claim 21 describes an optical manifold comprising a body having a plurality of hollow tubes, each of the tubes having an input end and an output end. The manifold further comprises a first endplate having a plurality of input openings in a first ordered arrangement, and a second endplate having a plurality of output openings in a second ordered arrangement which differs from said first ordered arrangement. The body is disposed between the first endplate and the second endplate, wherein each of the hollow tubes connects a single input opening with a single output opening.

As discussed above with respect to independent claims 1 and 14, Knudson does not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement, as described in the present application. Rather, in Knudson, it can be clearly seen that the input openings and output openings have the same ordered arrangement. Bylander et al. relates to a

microreplicated waveguide element that is integrally formed on the same substrate with a splice element. The combination of Knudson and Bylander et al. does not arrive at the invention of independent claim 21, because neither of the references disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement.

For at least this reason, the rejection of claims 21, 23 and 24 under 35 USC § 103(a) as being unpatentable over Knudson in view of Bylander et al has been overcome and should be withdrawn.

Claim 22, which depends from claim 21, stands rejected under 35 USC § 102(e) as being anticipated by Knudson and Bylander et al. As this rejection involves a combination of references, the rejection is understood by the Applicants to be a rejection under 35 USC § 103. In a phone call to the Examiner on December 9, 2003, the Applicants' understanding of the rejection was confirmed by the Examiner. Knudson and Bylander et al. are said to show all the features of claim 22, as combined above, except the body with the tubes flexible. Flexible materials are cited as being well known in the art of optical fibers. The Examiner thus states it would have been obvious to one of ordinary skill in the art to make the body of a flexible material, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as matter of obvious design choice.

Applicants have distinguished their invention, as embodied in independent claim 21, over Knudson and Bylander et al., because among other reasons, Knudson and Bylander et al. do not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement. Even if it is common knowledge to use flexible materials, the combination of such knowledge with the cited references does not produce the invention of claim 22, because the combination does not produce a device having input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement.

For at least this reason, the rejection of claim 22 under 35 USC § 102(e) as being anticipated by Knudson and Bylander et al. has been overcome and should be withdrawn..

Claim 25, which depends from claim 21, stands rejected under 35 USC § 102(e) as being anticipated by Knudson and Bylander et al. in view of Hutton et al. As this rejection involves a combination of references, the rejection is understood by the Applicants to be a rejection under 35 USC § 103. In a phone call to the Examiner on December 9, 2003, the Applicants' understanding of the rejection was confirmed by the Examiner. Knudson and Bylander et al. are said to show all the features of claim 25, as combined above, except the use of color-coding. Color-coding is said to be general knowledge, and Hutton et al. '390 is cited as disclosing the use of color-coding for optical fibers. The Examiner states it would have been obvious to one of ordinary skill in the art to color-code the tubes of Knudson because this would provide a means to identify the individual tubes.

Applicants have distinguished their invention, as embodied in independent claim 21, over Knudson and Bylander et al., because among other reasons, Knudson and Bylander et al. do not disclose input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement. Even if Hutton et al. shows color coding of optical fibers, the combination of the references does not produce the invention of claim 25, because the combination does not produce a device having input openings in a first ordered arrangement and output openings in a second ordered arrangement, where the second ordered arrangement differs from the first ordered arrangement.

For at least this reason, the rejection of claim 25 under 35 USC § 102(e) as being anticipated by Knudson and Bylander et al. in view of Hutton et al has been overcome and should be withdrawn.

In summary, the rejection of claims 3, 4-5, 6-13, 16, 19, and 21- 25 under 35 USC § 103 as being unpatentable over Knudson, either alone or in combination, has been overcome and should be withdrawn.

Double Patenting Rejections

Claims 1, 14 and 21 stand provisionally rejected under the judicially created doctrine of double patenting over claims 1 and 2 of co-pending Application No. 10/161,800. The rejection is provisional since the conflicting claims have not yet been patented.

Applicants respectfully acknowledge the provisional rejection, and will file a terminal disclaimer at such time one or more of the conflicting claims is patented.

Supplemental Information Disclosure Agreement

A Supplemental IDS accompanies this Amendment and Response, listing Hutton et al., United States Patent No. 6,381,390 B1. This reference was cited by name only in the Office Actions mailed October 7, 2002, and September 11, 2003, but has not been identified by a reference number in the Examiner's "Notice of References Cited" accompanying those Office Actions. Applicants have not previously identified Hutton et al. in any previously filed IDS or Supplemental IDS.

Conclusion

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested.

If it would in any way facilitate the allowance of the application, the Examiner is invited to contact the below signed attorney at the phone number provided.

Allowance of claims 1-25, as amended, at an early date is solicited.

Respectfully submitted,

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Date

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